IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Hill, et al.	Art Unit	: 1793
Serial No.	: 10/762,762	Examiner	: Paul Marcantoni
Filed	: January 22, 2004	Conf. No.	: 3116
Title	: SACRIFICIAL AGENT FOR FLY ASH CONCRETE		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

Sirs:

I, Carmel R. Jolicoeur, Ph.D., declare that:

1. I received my B.Sc. in Chemistry (1966) and my Ph.D. in Physical Chemistry (1969) from the Université de Sherbrooke (Quebec, Canada.). My dissertation focused on hydration and interactions in aqueous solutions. Following a two-year post-doctoral research term at S.U.N.Y at Stony Brook, also on molecular phenomena in aqueous systems, I was appointed assistant-professor in the Department of Chemistry at the Université de Sherbrooke (1971) and was promoted to Adjunct and to Full Professor (1980). Throughout my career, I have been actively involved in scientific research on various types of aqueous-based systems; over time, these evolved from aqueous solutions (e.g. electrolytes, surfactants, dispersants, polymers, and flocculants), to selected biological systems (e.g. amino acids, peptides, proteins, and complex cell cultures) and colloidal minerals (e.g. silica, silicate, gypsum, pigments, asbestos, cement, fly ash, and blast furnace slag). Through collaboration with partners in relevant engineering or industrial sectors, my research has contributed to various technology transfers and industrial applications. Since the late 1980's, I have been aggressively pursuing research in the chemistry of cementitious materials, with a particular emphasis on chemical admixtures for improving the properties of fresh and hardened concrete. I have led numerous projects on the beneficiation of blast furnace slag and fly ash for application in concrete. In my career, I have published over 100 peer-reviewed scientific papers and many of these publications address issues with concrete, including problems related to the use of fly ash in concrete.

2. I am a joint inventor of the subject matter set forth in the claims of the above-referenced application.

3. I have read the translation of JP 56022665 (Nippon Oils and Fats Co. Ltd.) that is of record for this application. JP '665 does not recognize the issues associated with using fly ash in cementitious compositions including the need to reduce or eliminate the effect of fly ash on air entrainment or to account for the variability of carbon content in fly ash when considering air entrainment. JP'665 is directed to maximizing air entrainment and the air-entraining agents described therein "have larger foaming power than traditional agents." See page 2, column 1, last full paragraph of the '665 translation.

4. I have read GB 2292141, an English language equivalent of cited reference DE 19528912 (Furusawa et al.). GB '141 describes an air-entraining mixture comprising (a) C12-C24 alkanoic (fatty) acids; (b) compounds of formula Ph-C8-9alkyl-O-$(EtO)_n$-H; and (c) salts of alkyl sulfonates, salts of alkyl aryl sulfonates, or sulfate esters of higher alcohols or resinates. See page 2, lines 6-16 of GB '141. The C12-C24 alkanoic acids described as surface active agent (a) are generally recognized in the art as air-entraining agents. The compounds listed as non-ionic surface active agent (b) are also generally recognized in the art as air-entraining agents and Triton® X-100 surfactant sold by Dow Chemical is an example. The salts of alkyl sulfonates and alkyl aryl sulfonates listed as compound (c) are further described on page 3, lines 12-15 of GB '141 as salts of C9-C12 alkyl and alkyl aryl sulfonates, which are generally recognized in the art as air-entraining agents. The high alcohol sulfates listed as compound (c) are described as having at least 12 carbon atoms on page 3, lines 15-18 and these compounds are generally recognized in the art as air-entraining agents. The sulfate esters of resinates listed as compound (c) are described on page 3, lines 18-20 as being based on rosin soap and would generally be recognized in the art as air-entraining agents. As air-entraining agents, the compounds in GB '141 (DE '912), when present in a cementitious mixture in an amount necessary to neutralize the detrimental effects of components of fly ash or other combustible ash on air entrainment activity, will result in greater than 2 vol.% additional air content when present in the same cementitious mixture without fly ash or another combustible ash.

5. I have read WO 85/01500 (Nicholson). Nicholson is directed to a cement additive comprising a mixture of (a) soluble alkanolamine and alkali salts of fatty acids, (b) soluble alkanolamine and alkali salts of certain sulfonic acids such as alpha olefin sulfonic acids, and (c) polyethylene glycol derivatives and fatty acid amides. See page 3, lines 23-29. Compound (a) is

described as a C12-C24 alkyl fatty acid salt on page 5, lines 2-14 and these compounds are generally recognized in the art as air-entraining agents. Compound (b) is further described as alkyl or alkylaryl sulfonates wherein the alkyl group includes 12 to 24 carbons on page 5, lines 15-25 and these compounds are also generally recognized in the art as air-entraining agents. Compound (c) is preferably a compound of formula $RO(CH_2\text{-}CH_2\text{-}O)_nH$ wherein n=3-30 and R is H, a fatty acid ester, alkyl or alkylaryl. Where R is a fatty acid ester, alkyl or alkyl aryl, these compounds would generally be recognized in the art an air-entraining agents. Where R is H, the compound is a polyethylene glycol (PEG) and the claims in the above-referenced patent application specifically exclude polyethylene glycol. The fatty acid amides are described on page 5, lines 35-36 and these compounds would generally be recognized in the art an air-entraining agents. As air-entraining agents, the compounds in Nicholson, when present in a cementitious mixture in an amount necessary to neutralize the detrimental effects of components of fly ash or other combustible ash on air entrainment activity, will result in greater than 2 vol.% additional air content when present in the same cementitious mixture without fly ash or another combustible ash.

6. I have read U.S. Patent No. 6,599,358 (Boggs). Boggs is directed to the use of aromatic carboxylic acids and hydroxyl substituted aromatic carboxylic acids as carbon scavengers. These claims of the above-referenced patent application specifically exclude aromatic compounds having carboxylic acid groups or salts thereof.

7. I have read U.S. Patent No. 5,110,362 (Hoarty). Hoarty is directed to the use of air-entraining compositions that include a water soluble C8 fatty acid salt in combination with C9 and C10 fatty acid salts. The C8, C9 and C10 fatty acid salts would generally be recognized in the art as air entrainment agents. As acknowledged at column 2, lines 13-16, the other compounds described as air entrainment agents, i.e., Vinsol resin/abietic acid salts, ether sulfates, alkyl sulfonates, alkyl-aryl sulfonates, and amine oxide salts are generally recognized in the art as air-entraining agents. As air-entraining agents, the compounds in Hoarty, when present in a cementitious mixture in an amount necessary to neutralize the detrimental effects of components of fly ash or other combustible ash on air entrainment activity, will result in greater than 2 vol.% additional air content when present in the same cementitious mixture without fly ash or another combustible ash.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Carmel R. Jolicoeur, Ph.D.

Date: Sept 4, 2008.